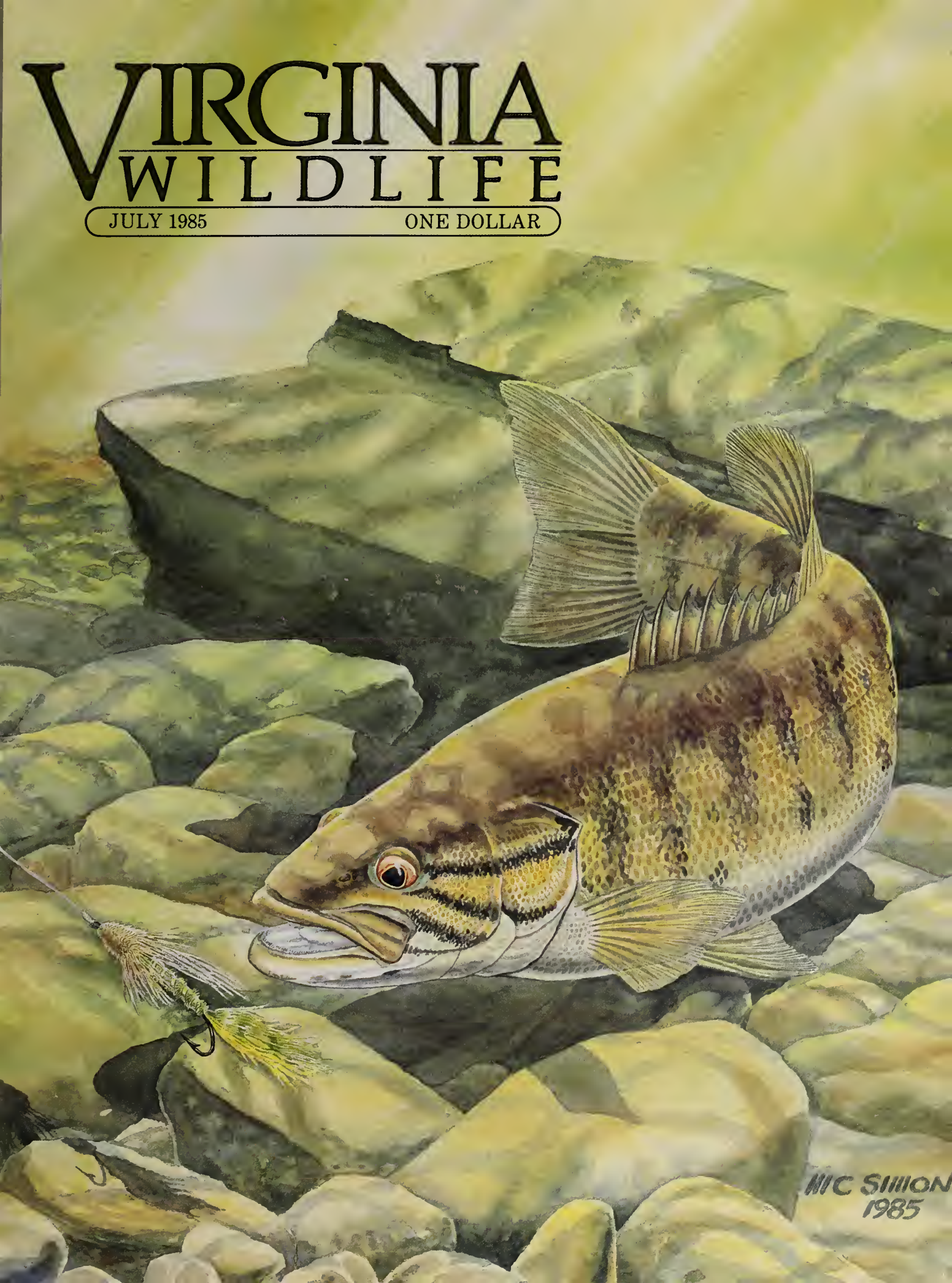
VIRGINIA WILDLIFE

JULY 1985 ONE DOLLAR



VIRGINIA WILDLIFE

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Dedicated to the Conservation of Virginia's Wildlife and Related Natural Resources

Volume 46, Number 7 *July 1985*

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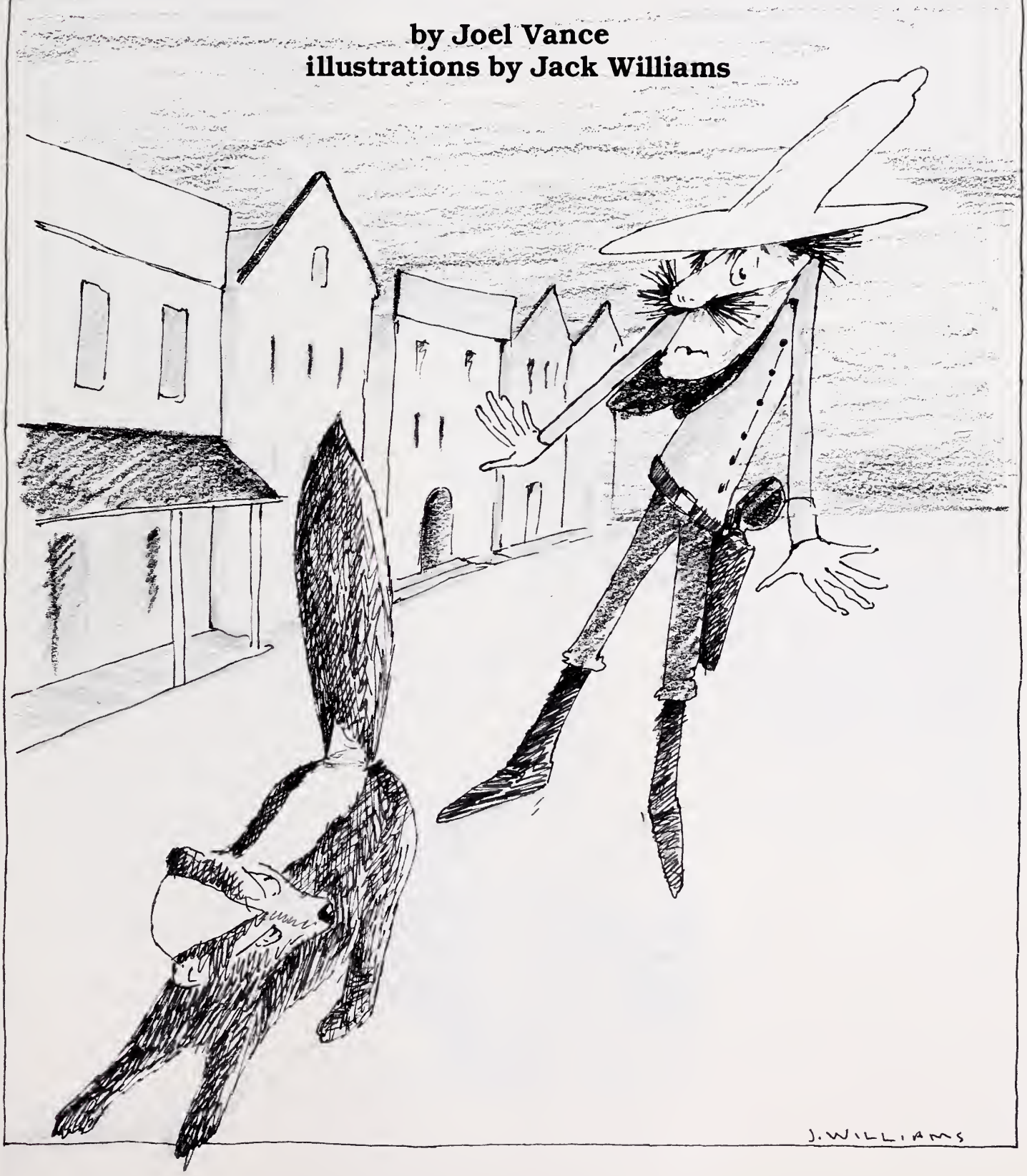
Raising A Stink

Nothing, no nothing beats a skunk when you finally ask, who won?

by Joel Vance
illustrations by Jack Williams



If a skunk has a natural enemy, it must be lightning. No animal in its right mind would attack a skunk. Of course, bird dogs are a notable exception.

Take one Brittany and one setter, who, together, may have the common sense of the average rock, and confront them with a skunk, and you are guaranteed of a pair of dogs best enjoyed from a distance of one county.

The Brittany was mine; the setter my hunting partner's. We were 40 miles from home; the temperature was about 20. My car was almost new and although it did not still have the factory-fresh smell, it certainly did not stink like Hell's locker room.

To make a short story longer and more depressing, we rolled the dogs in pond mud and repeatedly pitched them as far as you can throw a bird dog (a long way under extreme provocation into the icy pond). It was traumatic for the dogs—sprayed by a pussycat, then assaulted repeatedly by a loving master.

No one is the winner in a Close Encounter of the Skunk Kind. The skunk goes off in a pout and his victim goes off in a fog that makes him every bit as socially acceptable as dermatitis on a *Playboy* model's best side.

Mephitis, the skunk's Latin name, means "noxious exhalation" and there's no quarrel with that. Skunks secrete their atrocious attar in a pair of glands at the base of the tail and, as one backpedaling observer said, "If you can see both ends of a skunk, you're in trouble."

That's because Br'er Skunk often looks over his pert shoulder to sight in on a target. He can fire a volley of droplets, or a ferocious fog, up to 16 feet, which is more than twice Kareem Abdul Jabbar laid end to end. The normal skunk isn't quick on the trigger and usually will reveal his distaste for you by pattering his front feet, a little dance of irritation that you are well-advised to applaud from a distance of at least 16 feet.

The oily yellow secretion chemically is butylmercaptom which may help to know in a game of Trivial Pursuit, but won't help defang your social unacceptability if you are wearing it. Household ammonia will somewhat ameliorate the stench in clothing, a cup to a gallon of water.

"It was traumatic for the dogs— sprayed by a pussycat, then assaulted repeatedly by a loving master."

There is a soap, available from veterinarians, that tones sprayed dogs to a dull stink. Tomato juice is an oft-quoted remedy for skunkification; however, I once briefly shared a motel room with a Labrador retriever who had compounded a dog felony by rolling on a dead skunk—the result was enough to drop buzzards from the sky. Her master, eyes watering, sloshed the cringing mutt with tomato juice and about a half-gallon of Lemon Fresh.

As a result, she stank like a skunk under a lemon tree in a truck garden, and we banished her to the outside where she howled all night and caused large, burly truckers to inquire in menacing growls who owned that dog.

Probably the most common encounter with a skunk these days is between an automobile and a skunk. Both lose. In February, the putrid pussies seek each other to fall in lust and they frequently cross roads, leading to the inevitable confrontation with one of Detroit's native wildlife species—Cougar, Impala, Bronco, etc.

Bill Mauldin, the Pulitzer prize-winning cartoonist, creator of Willie and Joe, the quintessential war-weary soldiers, was a devilish lad and he tells in his autobiography, *A Sort of a Saga*, about how he and his brother, Sid, got even with a man they didn't like. They had trapped enough skunks to accumulate a half-pint of skunk musk some of which they poured on the exhaust manifold of the man's car. The porous metal soaked up the fluid like a sponge and every time the engine got hot, so did the owner's temper.

All the skunkologists agree that no matter what remedy you try, time is the only totally effective cure.

Skunk oil, however, is not totally without redeeming social value. It has been used as a stabilizing agent in perfumes. My father was a perfume oils salesman, and I remember some of his rare ingredients were among nature's most dreadful stenches. It is befuddling to realize that yon gracious lady, decked in ermine and dripping with diamonds, may well be wearing a seductive perfume that originated in the back end of a skunk.

Skunk oil once was highly prized as an ingredient in folk remedies for respiratory ailments, and is still used in concoctions to make trappers and hunters smell less like humans and more like native wildlife.

Another new use for skunk juice is as a repellent for human skunks—muggers, rapists and the like. *Skunkgard* is a patented device for warding off attackers. "When properly used, it creates a progessively more intolerable environment," says the promotional literature in one of the more understated advertising claims of the century.

Skunkgard was invented especially for use by women threatened by rape. As opposed to mace, there is no chance of misfire—the *essence de Pepe le Peu* is in a breakable capsule, like smelling salts. Crush the capsule either on your person or on the attacker and the party's over. Included is a vial of neutralizer which is fairly effective in shampooing out the shimmering stench.

According to Dr. Jack Scaff, Jr., one of the co-inventors of Skunkguard, "skunks will not spray each other even when fighting (professional courtesy, I suppose)."

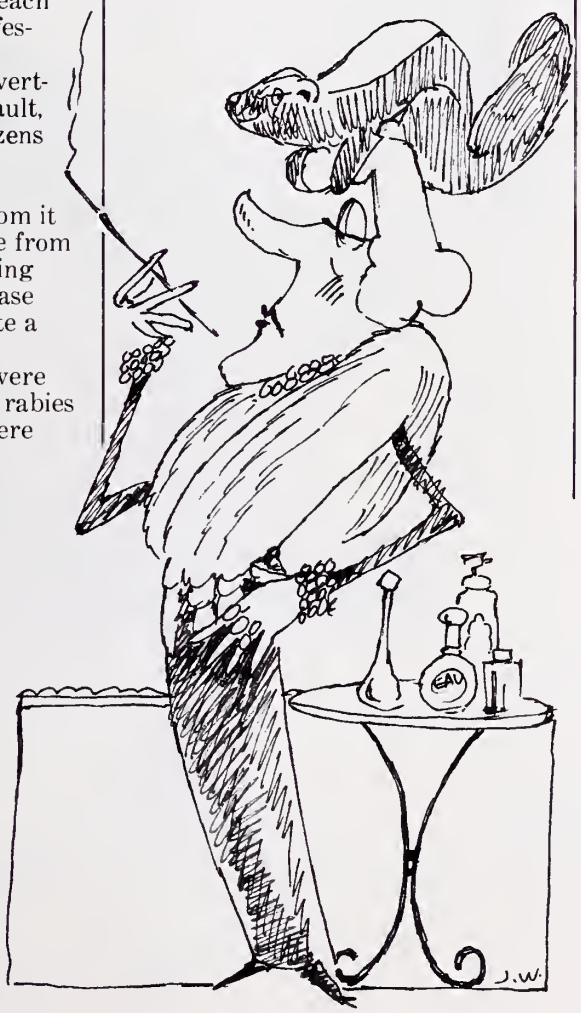
Although skunks may, inadvertently, discourage criminal assault, they are not always model citizens themselves. Skunks are prime vectors of rabies.

Rabies is rare and deaths from it are far less common than those from insect stings or bites, or lightning strikes—but it is a fearful disease with roots so ancient they excite a primal terror.

In one state recently, there were 379 confirmed cases of animal rabies in a year. . .and 299 of them were skunks.

That reflected a probable epidemic of rabies among skunks and perhaps in a different year, some other species might have been the leaders, but skunks are always among the most prone animals to the dread rabies. Since they are slow-moving, with no normal need to flee from anything, they are prey to bites from other rabid animals.

". . .yon gracious lady, decked in ermine and dripping with diamonds, may well be wearing a seductive perfume that originated in the back end of a skunk."



The first reference to skunks was by Gabriel Sagard-Theodat, a Canadian historian, in 1636, who called them "enfans du diable"—children of the devil.

Actually, that's not fair, for there is no malice in a skunk. He has been endowed with a frightful natural weapon, but he doesn't go around like some barroom bully flexing his muscles. Skunks are placid. Just don't push them around.

I've read in the few references (naturalists, for some reason, hesitate to plunge into skunkology) that no animal will attack a skunk more than once, but I know that to be false.

Some dogs never learn. I guess there is such animosity built up by the first defeat that they are blinded to the consequences of any future encouters. (Speaking of blinding—while skunk essence will cause eye irritation, it is not poisonous, nor will it cause permanent damage.)

There are four skunk species in North America, of which the striped is the most common. The others, spotted, hognose and hooded, are found farther west. And there are 13 subspecies of the striped skunk.

Despite several cat-associated colloquial names like "woods pussy," a skunk isn't in the cat family, but is a mustilid, along with weasels, otters, badgers and mink. Young are called kittens and litters range from four to 10.

Taxonomists decided to call the skunk what it is, so they doubled his Latin name for emphasis—he is *Mephitis mephitis*. According to naturalist Ernest Thompson Seton, Indians in the midwest called the skunk "shee-gawk" and claimed Chicago, or "skunkland," was derived from that (though the Chamber of Commerce doubltess plays that down).

Seton once ran a skunk ranch, raising the animals for their pelts. When the skunkery ran into hard times, he offered his animals to the War Department, proposing that skunk raising would be a good business for returning World War I veterans. Doesn't seem to have caught on, though.

Skunks range over most of North America, north into Canada, and far south in South America. They live in caves or abandoned burrows of other animals and often are found under buildings.

This may cause no problems, for skunks do not look for trouble; but there are exceptions. A friend told me that once he had built a lovely duck blind in a a prime location and, before the season opened, a skunk took up residence.

There was a condition of peaceful co-existence until the first flight of ducks came in and the first volley shattered the calm. Although the hunters got in the first shot, the resident skunk got in the last. There arose from the water the survivors of the duck flock and there arose from the cracks in the floor a hideous bouquet that ended the hunt.

The traditional hero of Westerns, Randy Scott or John Wayne, stands, fists filled with six shooters and growls, "Yuh dirty lowdown skunk! I'm takin' yuh in!"

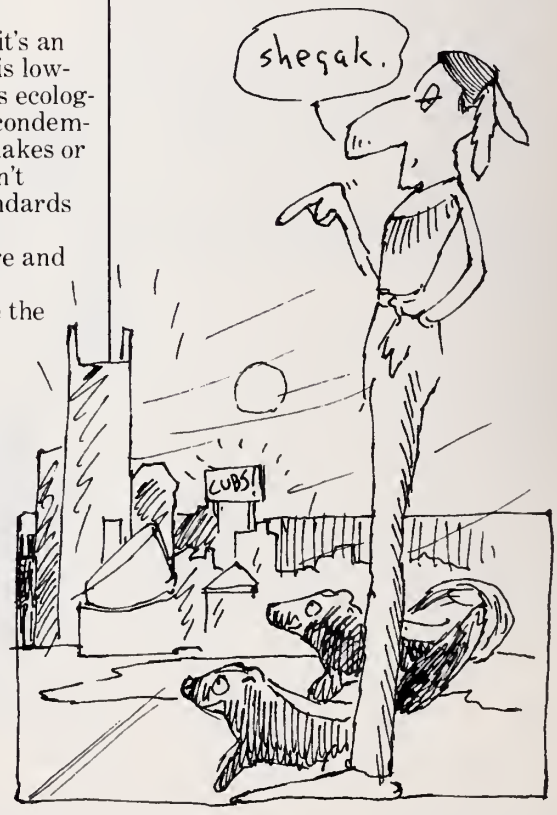
But the skunk is not dirty (it's an extremely clean animal) and is lowdown only in stature, not in its ecological role. Nor does it deserve condemnation any more than rattlesnakes or other wildlife citizens who don't happen to conform to our standards of conduct.

Skunks are what skunks are and they aren't about to change.

Maybe it's up to us to make the adjustment. □

"If you can see both ends of a skunk, you're in trouble."

"Indians in the mid-west called the skunk 'shee-gawk' and claimed Chicago, or "skunkland," was derived from that."



Smallmouth are Special

Bass are fine, trout are ok, but smallmouth are, to the author, something else indeed!

story & photos by Pete Elkins

Sometimes they come with the explosive suddeness of a great barred cat ambushing prey at a waterhole. They also come gently leaving a deceptively small swirl where the lure was but seconds before.

On some summer days when the big river's heated surface is leaden glass, they rarely come at all. During the dark months of January and February, they seemingly disappear.

But by March, they reappear, building in numbers and energy through early summer. Then, after a brief midday decline, they reach their prime as the leaves fall.

No other freshwater fish can match the smallmouth bass, and no other smallmouth are quite like those of Virginia's James River. Smallmouth are certainly not unique to Virginia. They abound in New England lakes and rivers. The giant TVA System of Kentucky, Tennessee, and Alabama offers hugh smallmouth bass. Farther west, smallmouth prowl the Snake River while eagles and bighorn sheep watch.

Even with the natural beauty of New England as a backdrop, smallmouth bass in lakes are essentially supercharged largemouth, with slightly different habitat and food preferences.

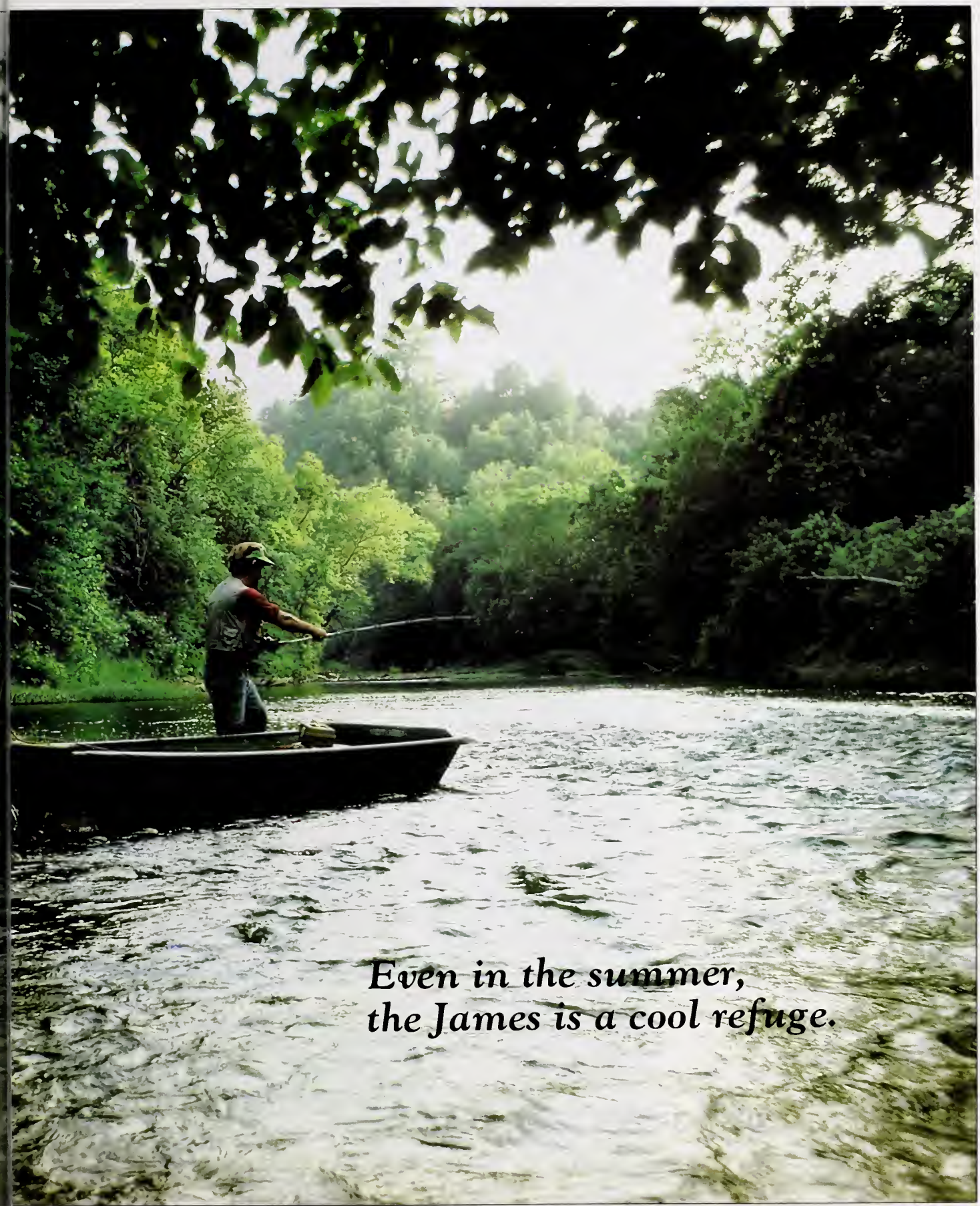
These same beautiful gamefish become magical creatures in the James. Much of the attraction may be the river itself. Above Lynchburg, the James cuts through steep rocky gorges with rapids that will test a canoeist skills. Although white water stretches are still frequent, the river's force mellows a bit below Scottsville.

Like the river, everchanging and mysterious, the surrounding country also changes, from foreboding rock faces to emerald pastures. Deer, turkey and waterfowl are abundant and tolerant of passing canoes.

Below the canoe, a marvelous variety of fish abound. Chunky rock bass, or "redeyes" to a youngster growing up in Virginia, are in the still pockets and under rocky ledges. "Redeye" attack artificial lures with the ferocity suggested by their scarlet eyes, but quickly bow to the rod pressure.

Scarlet is the color motif of the James' game fish. Redbreast sunfish are virtually everywhere. Willingness to strike and scrap on a light fly or spinning rod makes the redbreast a worthy fish in its own right.

Despite the appeal of rock bass and redbreast, the glamor fish is the


Even in the summer,
the James is a cool refuge.

scarlet-eyed smallmouth. Often fickle, always challenging, and sometimes frustratingly elusive, the smallmouth is king of the river.

As most avid bass fishermen know, the smallmouth bass prompted Dr. James Henshall, in his venerable *Book of the Black Bass*, to issue his famous statement about bass being the gamest fish "inch for inch."

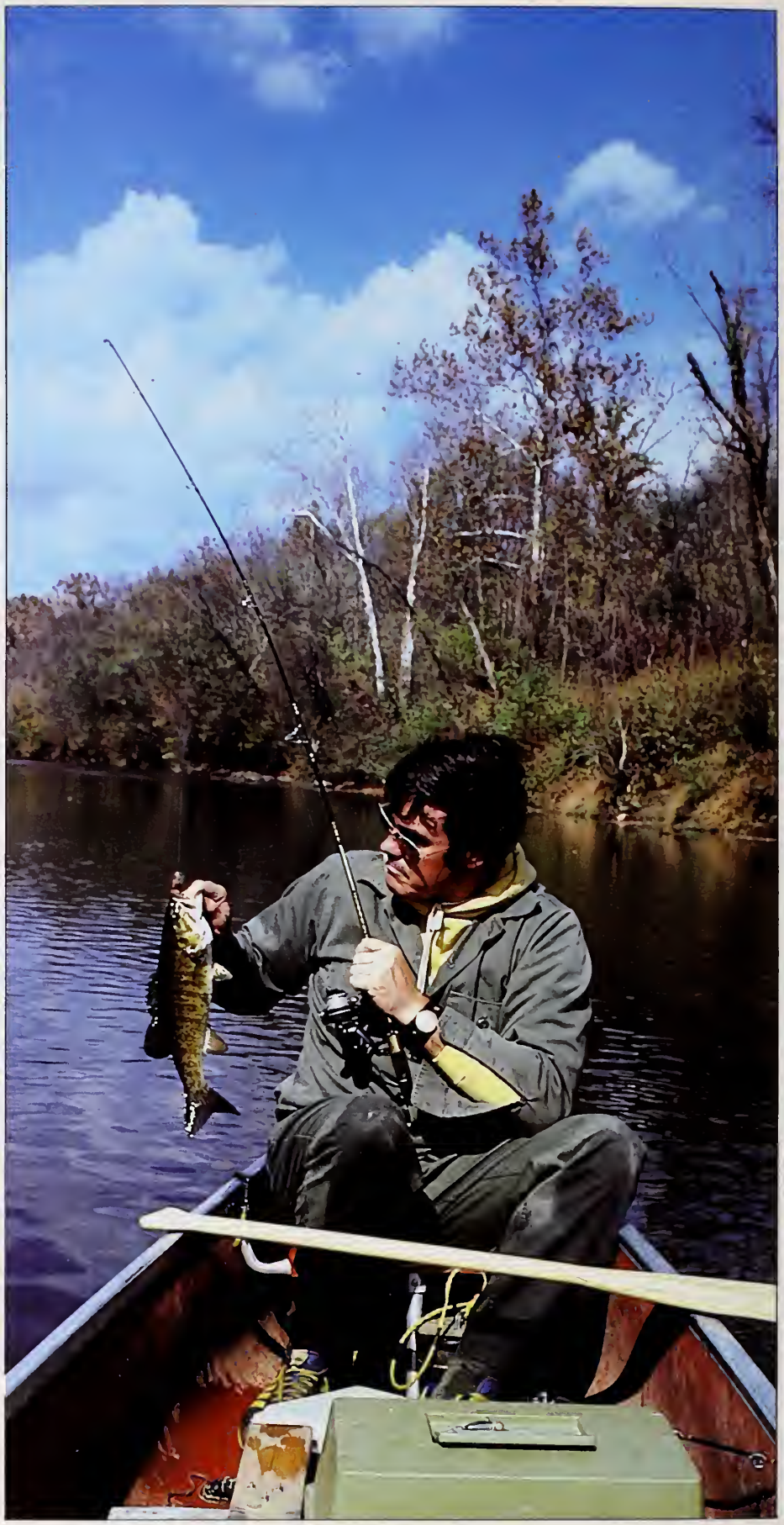
The James River's smallmouth seem forever intent not to let the good doctor down. For comparison's sake only, have a largemouth bass fanatic take you fishing in his metal flake, pedal to the metal, overcrowded, commericalized world on Big Lake anywhere in the South. Let him supply the rod, a medium heavy boron-graphite-xeon composite with pistol grip handle and space-age guides. Then hook a two-pound largemouth on 17-pound "extra mean" fluorescent line and play him to the boat. Fun? Sure it is, or a mushrooming crowd of bass anglers are sorely misguided. But how does the experience compare to a similar bass on the James River?

Substitute canoe and paddle for metal flakes and super-charged outboard engines. Substitute three whitetailed deer on a sandbar for 23 water skiers and 15 bass boaters in training for hydroplane racing. Substitute solitude for crowds and smallmouth for largemouth.

The result is a wild bronze-barred fish doing things to a light rod that a largemouth doesn't even aspire to. Most memorable of all, you probably had the experience solely to yourself and your fishing partner.

Solitude is a fast disappearing quality, especially in the bass fishing world. That quality still exists on the upper James River. Sadly, even there, solitude is becoming an elusive grail.

There are gradations of solitude, from the melancholic musings of a latter-day romantic to the misanthropic lair of a hermit. Angling solitude is of a totally different nature. It is an exchange of people for places, places where water runs clean and free, far from the drone of autos and outboards.



The James and its tributaries yield beautifully marked smallmouth like this one.

We remember fish for their surroundings as much as for objects in themselves. Smallmouth bass demand a higher class neighborhood than some of their finny cousins, and that reason alone will continue to take me back to the James River whenever possible.

This is written while surrounded by some of Georgia's finest largemouth bass territory. In nearby sloughs were an occasional alligator slides like a rough-hewn submarine beneath the murky water, largemouth in the 8- to 10-pound class abound. The sloughs open into a major river which forms one of the South's most fertile lakes some miles downriver. The river itself yields consistently good largemouth in the one- to three-pound category, supplemented by an abundance of large crappies, white bass and seasonal appearances of hybrids.

Yet, even when the largemouth are active, my thoughts are often of the James. Nostalgia for the river of my youth now that too many fishing season have passed? Perhaps. But there's more.

The nearby waters contain game fish in profusion, pro fusion matched only by water skiers, other anglers, and debris from upriver cities and towns. A largemouth bass that takes a topwater lure next to a floating section of styrofoam cooler, empty beer cans, a trail of discarded monofilament fishing line, and other assorted floatsam, loses a lot in the translation.

I remember the first big Virginia smallmouth. April had come warm and early, moving the bass into the still, shallow pockets near rocks and bright grass. I had launched my canoe in the morning chill. The day was an angler's dream: warming, overcast and calm. Foot long smallmouth enthusiastically attacked the tiny yellow torpedo. I released each fish in the clear water, watching it regain its balance, taste its freedom, then disappear with a sudden thrust of bronze caudal fin.

The shallow pocket was made for a big smallmouth. Two canoe proportioned rocks formed a vee with the open end leading to deep, black water. Grass, sand and gravel marked the apex. There, where the light bottom shifted to green would be the fish.

Somewhere in the primitive brain of the bass, microscopic impulses had urged it up from the winter depths into the more pleasing warmth of the shallow slot. Warmth reflected from sandy bottom and was absorbed by the dark submerged rock and the fish's flanks.

Hunger also flickered among the nerve cells, sending impulses to muscle systems within the smallmouth. It waited on that transitory line between shallows and depth, safe from observations by flying predators.

The warming water also prodded other lesser creatures to new activity. A crawfish slowly left the protection of a flat rock. Despite the slow movement, the smallmouth felt the tiny vibrations of carapace on rock and turned toward the source. The scarlet eye detected movement.

Alerted and defiant, the crawfish stood its ground, pincers raised toward the dark mass of the predator. The smallmouth tilted down toward the crustacean, then in an instant's flare of gills and tiny explosion of sand, the crawfish disappeared inside the massive jaws.

Immediately ejecting bits of gravel and sand, the bass swung back toward the deeper water. But hunger still intruded, a void unfilled by the two-inch long crustacean.

The unblinking eyes detected movement overhead, an erratic swirl of something small and alive. Unsated by the luckless crawfish, the bass struck, engulfing the surface creature.

"Big smallmouth, " I breathed aloud as the fish took the surface plug. The fish broke through the surface twice in rapid succession, massive caudal pushing hard against the water while the bronzed head shook in a vain attempt to dislodge the thing clinging to its jaw.

What passed for memory in the primitive nerve ganglia knew the alarming restraint as something experienced before, seasons ago as higher creatures measure time. Then it was a hellgrammite, homely and ill-tempered larvae of the dobson fly, that concealed the restraining thing. These same leaps into the air had broken the restraint.

But then the smallmouth had been three pounds of prime muscle and condition. Now the fish was twice the weight and older. Two more jumps, the second clumsier than the first.

"Beautiful," I shouted, unmindful that no one was near to hear. The hooks had held, and I knew that the biggest smallmouth of my life would soon be mine.

Tiny grains of sand irritated the fish's gill filaments as it rolled in a cloud of silt, trying to dislodge the thing in its jaw by scraping against the sandy bottom. Then, the fish turned upward for another jump. Lactic acid buildup had been swift during the protracted struggle, robbing the smallmouth caudal muscle of power. The jump barely broke the surface.

I applied more pressure when the tiring smallmouth half rolled on top. For the first time, the bass gave to the pressure, head and flank surging toward the rod. Wary of one last explosion, I eased off the drag, and reached for the gaping mouth. My thumb and forefinger pressed hard against the abrasive lower jaw. The smallmouth surrendered.

With a pair of needlenose pliers, I quickly extracted the small treble hooks from the upper jaw. Still, the smallmouth remained docile, only the rhythmic gill cover moving. From the moment of the strike, I knew this fish wasn't leaving the river.

I lowered the smallmouth back into the water. Steadying it with one hand under its belly, I waited while the gill contractions gathered strength and regularity feeling the power flowing back into the thick body, I slowly removed my hands.

In the dimming light, I watched the fish tentatively move as if testing its freedom. Reassured, it slowly glided from the eddy out toward the current, until, when dark water beckoned, it disappeared.

I watched for what may have been a long time. There were still two or three miles of river to travel before the takeout point. Those remaining miles held many other good smallmouth. But I knew that it would be full dark if I tarried.

I slipped the hooks of the plug into a guide of the spinning rod, stowed it under the canoe's thwarts, and paddled into the heavy current.

Only the river spoke for the next few miles. It spoke of the timeless rush of dark water over rock and sand and of the creatures now concealed below its eboned satin surface. It was a special time in a special place.

As the bridge above the takeout point silhouetted against the darkness, a large fish swirled heavily on top. It had to be a smallmouth, for no other fish had a right to be there. □

CANOE 101

An introduction to the basics of buying a canoe.

by Curtis Badger

Time was, when you wanted to buy a canoe, you would go to your local boat dealer, hand over a check, and the toughest decision you would have to make was whether you wanted the red one or the green one.

If you haven't gone shopping for a canoe in the past ten years or so, you will find that life for the canoe consumer has become a bit more complicated. The aerospace industry has come to the world of paddling, and the new variety of synthetic materials has made a sophisticated science of canoe design. Read a few canoe brochures and you get the feeling that buying a modern canoe is like buying a computer. You first have to learn an entire new language.

First there is the question of what your canoe should be made of. Aluminum is passe. Wood/canvas has a certain traditional beauty/elegance but lacks practicality. Your choices in this space age of canoeing are between the aromatic polyamides, thermoplastic laminates, polyethelenes, rotationally molded polyethelene, Hexel cores of Nomex, and, of course, the ubiquitous glass reinforced resin.

The materials list in a canoe brochure reads like the ingredients label from your favorite junk food wrapper. And like most junk foods, canoes are inedible.

Before you decide what material your canoe should be made from, you must first consider hull design. There are issues of proportion and taper, asymmetrical or symmetrical design, displacement, rocker, directional stability, initial stability, secondary stability, tumblehome, and whether you prefer your bottom flat, rounded, or V-shaped.

Once these important matters have been taken care of, and you have selected the material you want, then you can tackle the really tough decision. Do you want the red one or the green one?

Isn't this getting a bit ridiculous? Aren't canoes supposed to be the epitome of simple, graceful water travel? Didn't the American Indians do pretty well with birch bark for a lot of years?

Let's put all this into perspective. No matter how complicated it sounds, we are still dealing with the same water-borne conveyance used for centuries by the Indians. As my dictionary defines it: "A light, slender boat with pointed ends, propelled by paddles."

Other than having pointed ends and being light and slender, what else should a canoe do? That depends on what you expect it to do, what kind of water you are going to be traveling on, and what demands you are going to be making of your boat. This leads us back to the seemingly complicated issues of hull design and materials. Let's simplify things by saying that you should pick the hull design that best suits the kind of canoeing you are going to do. Some canoes are rather short and wide; they are slow and tiresome on long trips, but they are maneuverable and stable, perfect for exploring winding creeks and for hunting and fishing. At the other extreme is the long, slender canoe that glides through the water with little effort. This canoe is made for covering long distances. On a week long wilderness trip it performs well. On a narrow, twisting creek, it is the pits.

What we are talking about here is a matter of proportion. Let's say a canoe has a beam (the width of the hull at its widest point) of 36 inches. This means very little unless you take into account the length of the canoe. On a 20-foot boat, that width is tapered down to a sharp bow and stern over a length of ten feet, creating a sleek hull that will glide through the water almost without effort. On a 13-foot boat, however, the same beam has to be tapered down to nothing in 6½-feet; the result is a squatty, beamy boat that is not exactly a racehorse.

Some long canoes carry a wide beam a considerable distance fore and aft, then taper the hull quickly to a point. These boats are made for long-distance hauling. They have great displacement (carrying capacity), but the hull will be broad at the bow, causing it to plow through the water instead of slicing through it.

Now, what do you want your canoe to do? If you are planning canoe camping trips of a week or more, then you obviously wouldn't go for the 13-footer. You would want a touring canoe, or a tripper. These are fairly long boats that are made to carry a lot of gear. They are light weight for easy portaging, and they are built to

cover lots of miles. If you plan to stay in the boonies for an extended amount of time, you would want a wilderness tripping canoe, a boat that is high volume, high sided, and nearly indestructible. These boats are usually in the 18-foot-plus range.

At the other end of the scale, if most of your canoeing time will be spent poking around the nooks and crannies of local lakes, or exploring the narrow, upper reaches of creeks, your concern will not be long distance speed but maneuverability and ease of handling. In this case, a shorter canoe would certainly be in order.

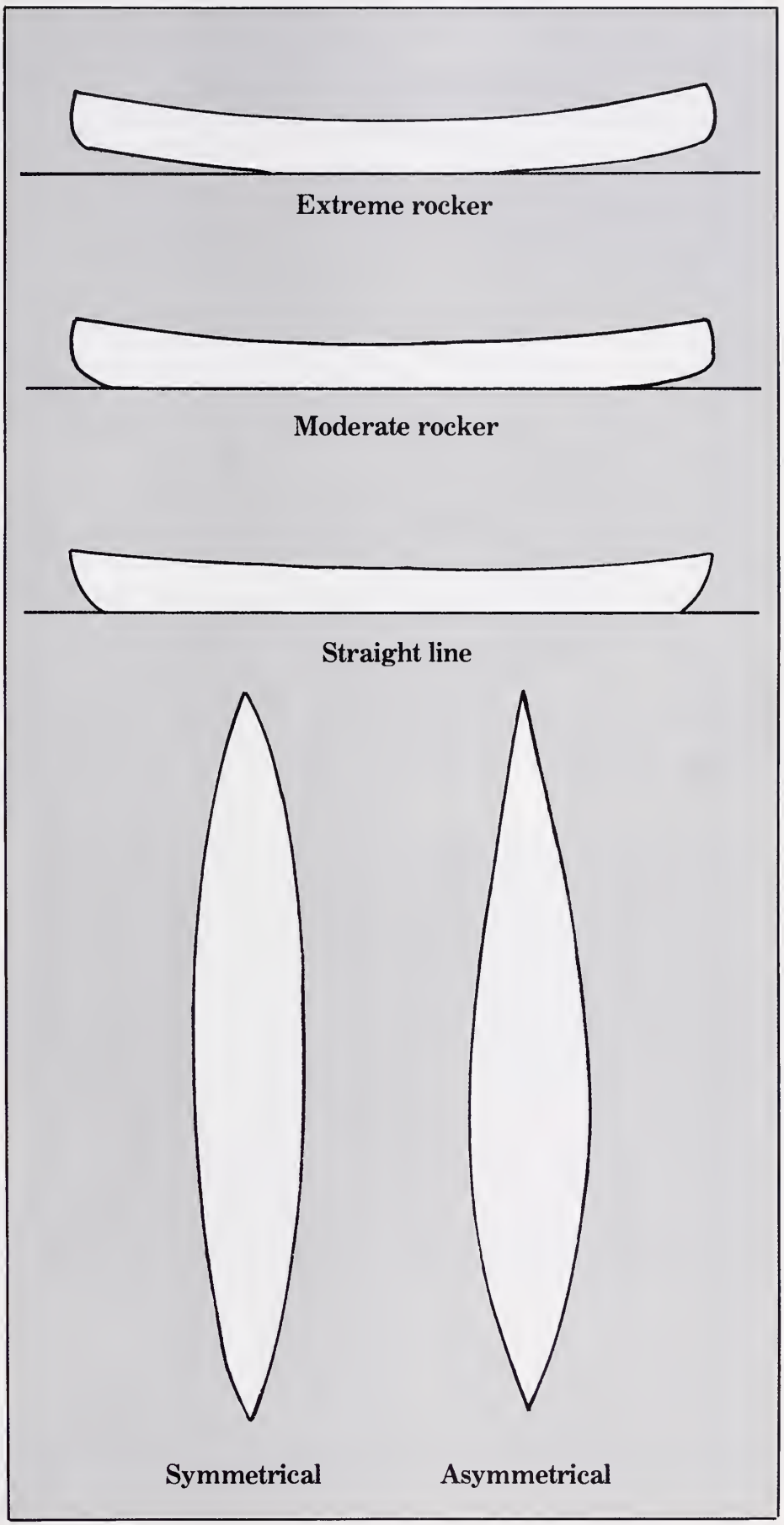
Keeping these general guidelines in mind, let's talk about some of the more specific aspects of hull shape. Don't be intimidated by all the canoe jargon; hull design is simply a matter of lines and curves, and these terms describe how the lines and curves work in relationship to each other.

Cross Section

Imagine you are looking at a cross section of a canoe, as if someone had cut it in half at the midpoint. The bottom and the sides have particular shapes that determine how the boat will handle. First, let's look at the underwater part of the boat. The bottom will be either flat, rounded, or V-shaped. A flat bottom has a great deal of *initial stability*. Beginning canoeists feel comfortable in a flat bottom boat because it is not tippy. It feels stable. It also provides a shallow draft, so if you plan to do much exploring in the shallows, you might want to consider a flat bottom boat.

One drawback is that a flat bottom canoe is not as fast as one with a rounded or V-shaped bottom. Another problem is that a flat bottom offers little *secondary or reserve stability*. This means that although a canoe with a rounded bottom feels tippy when you first board it, it will take a whole lot more effort to turn it over than it will a flat bottom boat. Once a flat bottom boat reaches a certain point of lean, the paddlers are going to get wet. Rounded or V-bottom boats are much more forgiving. Most hull shapes combine these characteristics, particularly in general recreation boats. The thing to remember is that the more exaggerated the round, or the deeper the V, the more initial stability you give up.

The above-water shape of the sides of the boat also contributes to stability. Generally, the sides will be described as either *straight, flared*, or *tumblehome*. In actual use, a boat may



combine a couple of these characteristics. Tumblehome describes a hull shape in which the beam is widest just above the waterline, then curves inward to the gunwales. Flared sides slope outward, and straight sides are a vertical compromise between the two; there is little or no curve at all.

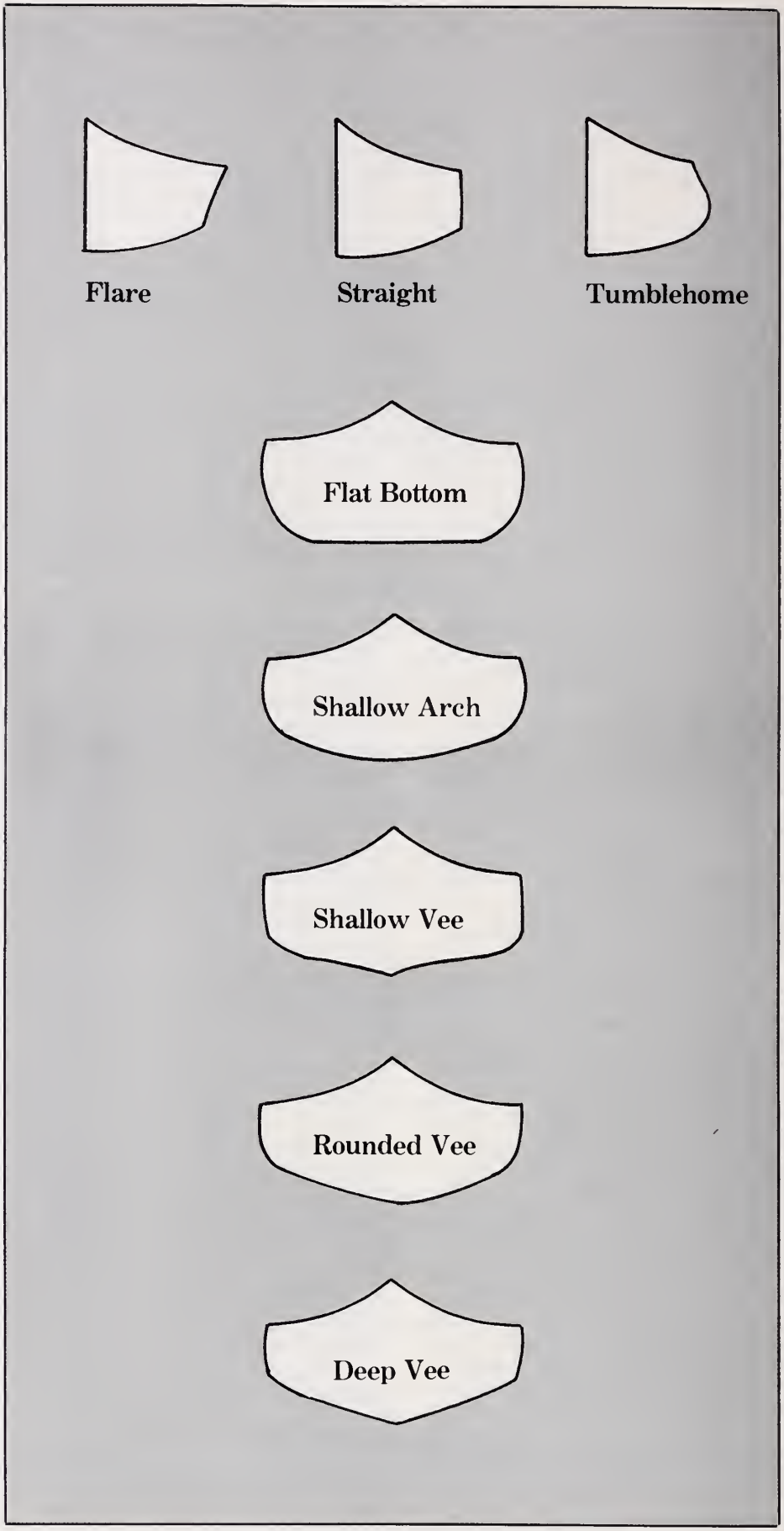
The most stable configuration of the three is the flared side. The width of a boat at the waterline is called the "working waterline," and in a boat with flared sides this measure will increase as the canoe is loaded, adding dramatically to the stability of the boat.

At the other extreme, in a boat with exaggerated tumblehome, the working waterline may decrease rapidly when the canoe is loaded, making the boat very unstable and sluggish to paddle.

So if a flared side is better, why not make it standard? Well, the more flare your boat has, the farther you are going to have to reach to get the paddle into the water. This can create a very uncomfortable situation on long excursions, especially if you are paddling solo and are sitting in the center of boat, where it is widest. The canoe you select will probably represent a compromise between tumblehome and flare; extreme examples of either design are used mainly in specialty canoes.

Now that we've looked at a cross section of the canoe, let's take a look at the view from the side. If the line along the keel rises as it approaches the bow and stern, the boat is said to have *rocker*. You can lay the canoe on a flat surface and rock it fore and aft, just like a rocking chair. The more rocker a canoe has, the more maneuverable it will be. Whitewater slalom boats, for example, have lots of rocker and are able to effectively pivot on the water. If you plan to do a lot of canoeing in water that requires great maneuverability, you'll want a boat with rocker.

As in other considerations of hull design, there are trade-offs involved in selecting a rockered or straight keel line. Although rockered hulls are easy to maneuver, they come up short in regard to *tracking ability*. A straight keel line offers lots of lateral resistance and keeps the boat going in a straight line; it has good tracking ability. If you plan to do your canoeing in open water where you will be vulnerable to wind and tide, a boat with a straight keel line will probably be for you. Again, most general purpose canoes will employ a compro-



mise. The keel line may be gently rockered, or it may be straight at the midsection of the boat, then rise slightly at the bow and stern.

Modern hull materials have enabled boat designers to build canoes that provide good tracking ability without the necessity of a keel. In some canoes, principally the aluminum ones, the keel is one of the structural elements of the boat. but the main thing a keel does is to keep you going in a straight line, especially if you have a strong sidewind. Keeled boats have their drawbacks, however. They make the canoe harder to turn and to perform draw and pry maneuvers, and they increase the draft and localize impact should your canoe strike an underwater object.

Many paddlers prefer canoes with keels, and the decision is largely personal. I feel that tracking ability is a function of hull design, and the advantages of a keel are outweighed by the disadvantages. But I've been wrong before.

Several years ago, some canoemakers broke away from the traditional notion that the proper canoe had to be identical at both ends. The result was an *asymmetrical hull* design that earned its pedigree in flatwater racing and canoe marathoning. Reasoning that what's good for the racer is good for the recreational canoeist, manufacturers are now incorporating asymmetrical designs in their touring and wilderness tripper models.

The theory behind the design is pretty simple. When a traditional canoe is paddled hard, the stern tends to be sucked down into the water and acts as a brake, much as a motorboat does before it reaches enough speed to plane. With the asymmetrical design, the widest part of the canoe is moved toward the stern, adding bouyancy to keep the rear of the boat up and providing a sleeker point of entry. The result is a canoe that is fast, easy to paddle, and which has excellent tracking abilities. The drawbacks are that the canoes do not handle easily, so you might want to stick to the traditional design for whitewater paddling, and the slimmer designs have very poor initial stability, so they might not be the perfect choice for the beginning paddler.

Materials

There are three major categories of canoe materials: wood, metal and plastic. The wooden canoe, of course, is what kindled America's urge to paddle. When the Europeans landed

photos courtesy of Old Town Canoe Company

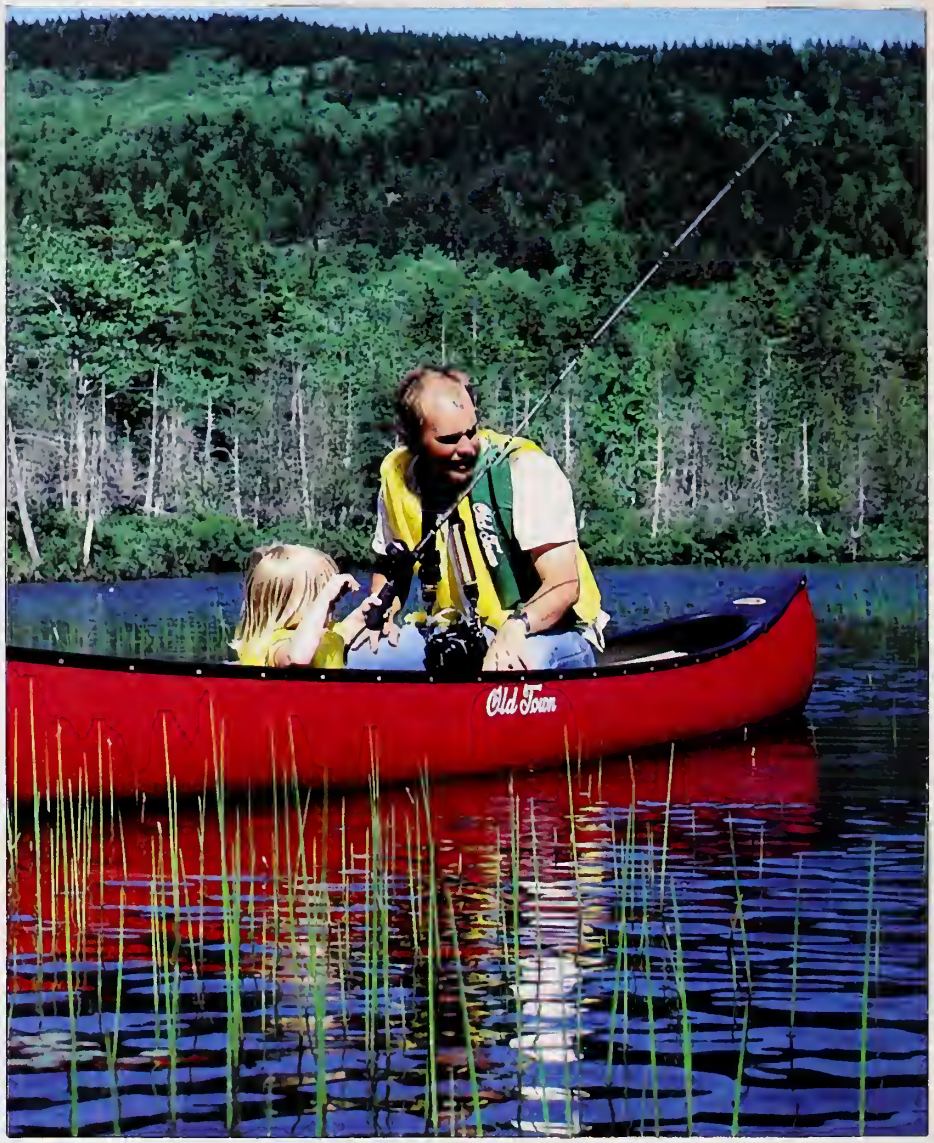
(Top) A high volume deep V hull. The shallow arch design handles white water well. (Bottom) Old Town's Katahdin is a classic design executed in fiberglass.

on the continent, they were amazed at the speed and agility of the birch bark and dugout canoes of the American Indians. The wooden canoe, in various forms, remained the standard for centuries. In the 1880's, Maine canoe builders began using a combination of *wood and canvas*, stretching the canvas over cedar ribs, much like the Indians covered their ribbed canoes with birch bark. The canvas was then painted, producing a smooth, tough surface that was relatively light in weight.

Until the end of the World War II the wood/canvas canoe was the standard of the industry. These canoes are still being marketed, as are wooden strip canoes covered with fiberglass, but both of these layups come at a premium in price and upkeep. Be prepared to spend $2,000 or more for a modern wood canoe, and be prepared to devote much time to performing maintenance duties. Still, a nicely finished wood or wood/-canvas canoe is a sight to behold. There is something about the patina of cedar, polished to a deep lustre, that seems to reflect an entire history and tradition of canoeing. There is a warmth and magic to wood that our space-age plastics will never match.

But if I were lucky enough to own, let's say, a classic wood and canvas Old Town that's in pristine condition, how could I stand to put it in the water? How could I risk dinging that hull on a rock? How could I subject such a noble creation to the indignity of dragging it through the salt marsh mud at low tide? Perhaps that's why you seldom see classic canoes in the water. They are most often spotted on the roof racks of BMW's.

When World War II was grinding to a close in 1944, the Grumman Aircraft Company was planning the direction the company would take in peace time. The result was a retooling effort to supply America with canoes instead of airplanes. The *aluminum* canoe revolutionized the industry. It made the canoe afforable, durable, and it turned a generation of Americans into white water enthusiasts. The aluminum canoe also disgusted the purists, who felt that the little boat that clanged and banged its way down the rapids was vulgar. But what the aluminum canoe lacked in ambiance, it made up for in utility and ecomony. Fur trappers in Alaska were said to have paddled the boats downstream in summer, then hitched them to dog teams for trips across snow and ice.



Old Town Canoe Company

A small, lightweight canoe that is ideal for hunters and fishermen.

The aluminum canoe is probably familiar to everyone who has ever attended summer camp. You scorched your hide on it in August, frostbit your tush in January, and you imitated the sound of a bell buoy every time the paddle came in contact with the hull. The canoe is noisy, uncomfortable, and generally limited in design, but it can take all the abuse you can dish out. Expect to spend in the vicinity of $500 for a 17-footer.

Plastics

Most canoes sold today are made of plastic. The most common design is *glass reinforced resin*, which we all know and love as fiberglass. Although the materials are definitely modern, the concept is not. In the 1870's Elisha Walters & Son of Troy, New York were making a paper canoe using a method very similar to modern fiberglass layup. Instead of placing fiberglass clothing in a mold and impregnating it with resin, Walters used heavy manila paper stips and impregnated them with glue. A wooden mold was used to form the boat.

If you're wondering just how seaworthy a paper boat could be, consider that in 1874 Nathaniel Holmes Bishop paddled one of Walters' 14-foot, 58-pound paper canoes from Troy, down the Hudson River, and south along the coast to the Gulf of Mexico, a journey of some 2,000 miles that would be remarkable in any kind of canoe. Bishop wrote about the trip in a book titled *Voyage of the Paper Canoe*, published in 1878. Excerpts from Bishop's book are printed in *On the River*, an anthology of canoe stories edited by Walter M.Teller. The book is available from Rutgers University Press.

Fiberglass is inexpensive, relatively light in weight, and can be molded into almost any hull configuration, so the possibilities for creative hull design are endless. If your canoe has a confrontation with a jagged rock, the repair can be done easily and well. Prices are in the $300 to $1,000 range.

Polyethelene begins in pellet form and then is extruded into sheets, which are vacuum molded into canoes. Polyethelene is inexpensive, but it is more flexible than fiberglass and usually requires some sort of structural support system. It is also more susceptible to sunlight deterioration than fiberglass, and it is more difficult to repair. Prices range from $300 to $500.

A variation on the polyethelene theme is layered polyethelene, a design which produces a stronger boat that does not need a metal keelson or framework. Old Town makes a *rotationally molded polyethelene* canoe that has cross-linked polyethelene as an inner and outer layer and polyethelene foam as a core. Old Town claims the canoe can be folded bow to stern and popped back to its original shape with minimum distortion.

The design is more sophisticated than standard polyethelene layups, and so is the price. Old Town's roto canoe sells for $555.

Royalex is a thermoplastic laminate made by the Uniroyal Company, and it has become a standard for white-water canoes. Royalex will take more pounding and punishing than any material on the river, and it will always come back for more. Like roto-polyethelene, Royalex boats can supposedly be wrapped bow to stern, then punched back into shape with hardly a bulge or a blemish. I prefer to keep the pointed ends pointing in opposite directions, so I haven't tried this yet. We'll go with the manufacturer's claim here.

Old Town Canoe Company

Light and swift, this traditional wood canoe is also durable.

Royalex is made of a vinyl skin which covers an ABS (acrylonitrile butadiene styrene) core and ABS plies. The sandwich is molded together by heat, which causes the central core of ABS foam to expand, forming closed-cell foam flotation within the hull. While the laminate is still hot, it is removed from the oven and placed in a mold, where it is vacuum-drawn into the hull shape.

In addition to being tough, Royalex is flexible and slick, a distinct advantage when you are slithering over rocks or submerged logs. The softness of the material is it's only flaw. Rocks and shells tend to gnaw at it, leaving scars and abrasions. An ABS canoe weighs about the same as a fiberglass one and costs somewhat more. Prices range from about $450 to $1,000.

If you want a premium quality, light weight canoe with a premium, heavy weight price tag, your choice would be Kevlar 49, an aromatic polyamide made by Dupont. To give you an idea how strong this stuff is, it's the same material used in making bullet-proof vests. Kevlar is manufactured in a process that is similar to fiberglass, but it is stronger and weighs ten to twenty percent less. It is more rigid than Royalex, and so is able to take the subtle curves of modern hull design. It will also take a substantial chuck of your bank account. Expect to spend $1,000-$1,500 or more for a Kevlar canoe.

The most exciting materials and designs are those yet to hit the market. The coming months and years are likely to produce high tech layups that will make the material discussed here seem old fashioned. As in motor racing and to other sports, competiton seems to be the litmus test for new designs and materials. Look for innovations to trickle down from racing and marathoning. Already there are flatwater racing canoes that weigh little more than one pound per foot; how long it will take canoe makers to apply this technology to mass market boats is anyone's guess.

No matter how quickly the technology of canoe design grows, there is beautiful irony in how remarkably unchanged the boat is over centuries of use. So lasting is the basic design, so simple in its use of line and curve, so competent in performing its function, the canoe can validly be considered a work of art: floating, functional sculpture, as Joel Barber once described the duck decoy.

John Boyle O'Reilly got it right almost a century ago. Writing in *Athletics and Manly Sport*, O'Reilly said, "The canoe is the American boat of the past and of the future. It suits the American mind: it is light, swift, safe, graceful, easily moved; and the occupant looks in the direction he is going, instead of behind, as in the stupid old tubs that have held the world up to this time . . . Boats are for work; canoes are for pleasure. Boats are artificial; canoes are natural." □

Night Flight

Some of nature's most beautiful insects await those who know when, and where, to look for them.

story & photos by
Paul Pajak and
William Kelso

It's 4:30 a.m. The bright light on the wall facing the forest has attracted a great variety of insects. Among the many winged creatures are those resembling the familiar monarchs and swallowtails, but these striking members of the insect world are not butterflies, but moths.

Moths, together with the butterflies, comprise the insect group called the *Lepidoptera*. About 11,300 species of moths have been identified in North America, and most are small and nondescript. Several types, however, exhibit a diversity of form and color that rivals their well-known cousins. Unfortunately, because of the nocturnal (nighttime) habits of all but a few moths, most people are unaware of what they are, how they live and where they can be found.

The life cycle of the typical moth includes a series of stages that bear little resemblance to one another. After mating, the female moth lays from a few to several thousand eggs, often on a single type of tree or plant that will serve as food for the young. Upon hatching, the young moths, commonly called caterpillars, feed voraciously and grow so rapidly that they must shed their skin at least three times. It is these worm-like caterpillars, commonly called grubs, that are most familiar to man. At the end of the caterpillar stage, the moth larva spins a silken cocoon while attached to vegetation, or builds an earthen cell in the soil, and then undergoes the amazing metamorphosis to winged adult. This remarkable change in form and locomotion can take from a few days to several months, depending on the species. At the end of this period, the adult emerges, allows its wings to dry, and begins its maiden "flight." Surprisingly, many species do not feed as adults. They spend this relatively short-lived period of their lives solely in search of mates. Females attract males by emitting a special scent called a pheromone which can be picked up at great distances by the male's large, specialized antennae.

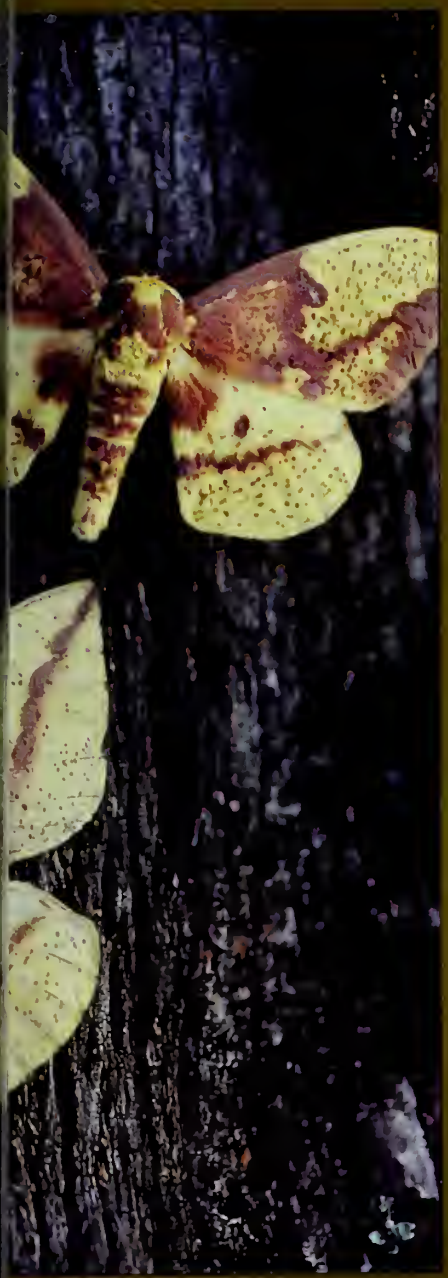
Regal Moth

Virtually all moths face a variety of natural hazards during the day and night, but are amazingly well adapted to survive them. Although their nocturnal habits allow most moths to escape the drying heat of the day, nighttime temperatures are often too cool for efficient flight. However, the large, furry bodies of many moths are very efficient at retaining body heat enabling these moths to find mates and food. Darkness also brings the danger of insect-eating bats, which can be avoided by some species through the use of "hearing" organs located on their sides or legs. By day, camouflage coloration permits some species to rest on tree bark, undetected by feeding birds. When approached, several moths are known to startle potential predators away by suddenly exposing the "eyespots" on their underwings. Other species do not rely on camouflage and eyespots, but are brightly colored. Like many butterflies and other insects, some of these highly-visible moths are recognized by predators as being bad-tasting and are generally avoided. The smooth scales covering the wings and body are yet another form of protection from predators and can often help an individual to slip from an unfirm grasp. But of all the adaptations for survival that moths possess, it is their common ability to navigate using the stars and moon that is most amazing—and the one that often finds them misguided by a backporch light!

During their night flight, the spectacularly-shaped and colored moths pictured here can be seen. Most of these moths are active only during and after sunset and are frequently attracted to bright lights. By locating lights near different types of vegetation, one can easily find an assortment of moths.

The largest and by far the most impressive of Virginia's moths are the Giant Silkworm moths (*Saturniidae*). This group includes the largest North American species, the Cecropia moth, with a wingspan of up to six

(This page) Imperial Moth; (inset) Io Moth; (opposite page) Polyphemus.



inches. Other closely related species show the various shapes and colors of the Saturniid family, from the delicate beauty of the Luna moth, to the subtle browns and velvety eyespots of the Polyphemus moth. Some species, such as the Io moth, show distinct color or size differences between the male and female, called sexual dimorphism, while in other species the two sexes are quite similar.

Two elaborately-colored species, the Regal and Imperial moths, are commonly active in midsummer throughout Virginia. These species are similar in their habits, as neither spins a cocoon, but undergoes metamorphosis underground in an earthen cell. In addition, both species prefer hardwood forests and are attracted to artificial lights during their nightly movements.

Another group of moths that are active at twilight and are frequently encountered during the night hours are the Sphinx moths. Several species of Sphinx moths are abundant in Virginia. Most are strong fliers with thick bodies and narrow, hummingbird-like wings that can beat from 40-70 times a second. Sphinx moths feed in much the same manner as hummingbirds, hovering above flowers at dusk and extending their long tongues in search of nectar. Fluorescent lights are especially attractive to Sphinx moths, and with their ornately patterned wings they are a very conspicuous part of the nocturnal moth community.

On these pages we have shown you a few examples of the tremendous array of moths to be found in Virginia. Their elegant shapes, intricate patterns, and rich colors equal the beauty of any group in the animal kingdom, yet because of their nocturnal habits, many people are unaware that they even exist. The predawn hours are a time of peak activity for many animals, and a rewarding glimpse of some of nature's most brilliant artwork awaits those who know when, and where to look. □

Luna Moth

Marlin at 20 Miles

by Bob Hutchinson

Marlin just off the Virginia Coast? What started as a dream in 1937, has led to a sport that now accounts for more than 600 fish a year.

In 1937, a group of well-to-do Richmond sportsmen decided it was time to do something about a strong conviction they shared. The result eventually was to alter the face of saltwater sport fishing in Virginia.

For several years, boats sailing from Ocean City, Maryland had been finding startling numbers of white marlin just a few miles offshore. Since Ocean City is on the coast just a few miles north of the Virginia border and Chincoteague Island, Virginia, the Richmonders concluded that the same schools of fish were accessible to Virginia anglers.

Among them was Winston (Monk) Montague, who had fished out of Miami, Florida, with a charter skipper named Johnny Cass. They contacted Cass and made arrangements for him to bring his boat . . . and his talents . . . to Chincoteague.

When Cass arrived, Chincoteague's annual Pony Penning and carnival were in full swing. The island community was crowded with visitors who had come to see the famous Chincoteague wild ponies rounded up on Assateague Island, across Chincoteague Channel, and sold at public auction during the Pony Penning celebration. The highlight was the swim across the channel.

On his first day out, Cass and his party fished the same waters as the Ocean City boats. The area is known as the Jackspot. It's about 20 miles southeast of Ocean City Inlet and 25 miles northeast of Chincoteague Inlet. It was named for Jack Townsend, an Ocean City resident who allegedly caught the first Maryland marlin there in 1921.

Cass, a master fisherman, who now lives in and guides out of Marathon in the Florida Keys, was a veteran of billfish waters in South Florida and the Bahamas, as well as the U.S. Virgin Islands. So, the next day he decided to sail due east to see if he couldn't find concentrations of white marlin closer to Chincoteague. In those days, boats weren't running 30 miles an hour, as many are today.

He struck pay dirt less than 20 miles east of the red-brick lighthouse on Assateague Island. That evening, he and his anglers returned to their Chincoteague berth with 12 white marlin. This was in the days when conservation was a background subject, so, to impress people the entire catch was brought ashore.

When word of the episode spread across the island, almost everyone left the Pony Penning and carnival to see the fish. "It was the damnedest turnout I ever saw," Cass recalls. "I never saw so many people in my life. I don't think there were 10 people on the island who didn't come down to the docks."

Cass didn't know it at the time, but

he started a revolution in Virginia fishing, a revolution that was interrupted by World War II and the immediate recovery years. It was a revolution which has reached full fruition in the past 15 years, with unparalleled numbers of Virginia anglers testing offshore waters for white marlin, blue marlin, sailfish and other members of the billfish family.

Last summer, over 100 boats competed in the annual Small Boat Marlin Tournament, staged by the Virginia Beach Anglers Club and held out of Rudee Inlet as the south end of the Virginia Beach resort strip. The major tournament rule is that boats are limited in length to 26 feet or less.

Also last year, the annual Virginia Beach Marlin Tournament, hosted over the Labor Day weekend by the Cape Henry Billfish Club, was the most successful billfish tournament on the East Coast. Almost 200 billfish. . . mostly white marlin . . . were taken by the tournament's 50 registered boats during a three-day span. All but a few fish, saved for mounting, were released unharmed.

Last September, a boat out of Virginia Beach set an East Coast record when its anglers caught and released 106 white marlin in a single day. The boat was the Bonte, a 64-footer owned by Horace Gray of Virginia Beach and Richmond and skippered by Gary Richardson. The anglers used a quick-release method, known as the Palm Beach release, developed in South Florida.

As it was when Cass and his anglers boated 11 fish in a single day off Chincoteague in 1937, the white marlin remains one of the ocean's greatest fighting fish. It's as quick as a cat, it leaps higher than a kangaroo, it runs faster than a rabbit, and it grayhounds over the surface like a houndfish. Pound for pound, it just might be the Sugar Ray Leonard of ocean fishing, the fighter of fighters.

"It's the best billfish," says Fred Kushin of Virginia Beach, a pioneer white marlin guide who has caught Virginia marlin in everything from 16-foot Boston whalers to 60-foot custom-built luxury yachts.

"Some of the others, like the blue marlin and black marlin, are bigger," says the man who skippers the Honey Bun out of the Virginia Beach Fishing Center of Rudee Inlet. "But if white marlin grew to weigh 1,000 pounds, it would be almost impossible to catch one, unless it jumped. I've caught white marlin that jumped at

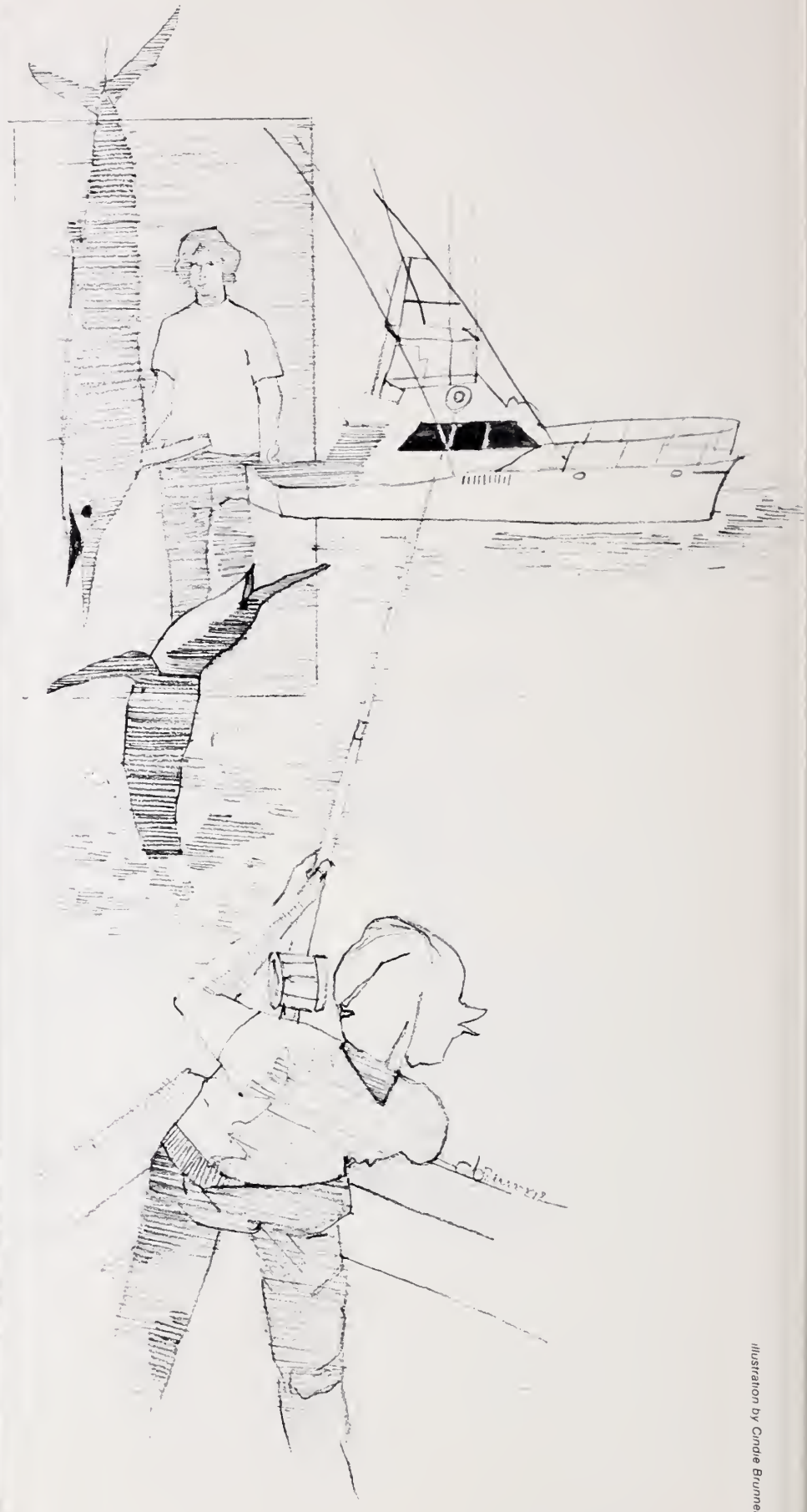


Illustration by Cindie Brunner

least 50 times. All the way out of the water. Just one jump after another. And when you get them to the boat, they're still green and full of life.

"I think they're harder to hook than the others, too. Sailfish are pretty easy to hook. And when a big blue marlin comes smoking through your baits, he's always hungry and ready to swallow anything you're dragging behind the boat. But not the average white marlin. Although you get a few crashers who just smoke it on in and eat. On the average, though, you have to show some skill to hook a white marlin. Different techniques work on different days, but you still have to show some skill."

In 1983, Virginia's white marlin fishermen earned 664 citation plaques for outstanding catches registered with the Virginia Salt Water Fishing Tournament. Of these, 585 went to anglers who released their catch. Of the 79 fish that were boated, the heavy weight was an 85¾-pounder claimed September 17 by Scott Dearing of Virginia Beach. The state record is 131 pound, 10 ounces, set in 1978 by Rudolf van't Riet of Richmond. The world record stands at 181 pounds, 4 ounces. That fish was caught off Vitoria, Brazil, in 1979 by local angler Evandro Luiz Coser.

In 1983, Virginia's white marlin fishermen earned 664 citation plaques for outstanding catches registered with the Virginia Salt Water Fishing Tournament.

While good numbers of white marlin are still taken by boats running from Chincoteague and other Eastern Shore seaside ports, most fishermen now sail from metropolitian areas like Virginia Beach and Norfolk. Rudee Inlet, in Virginia Beach, is the most popular port of embarkation because it offers almost instant access to the Atlantic Ocean, about halfway between Norfolk Canyon and the Cigar seamount.

The Canyon, a crack in the bottom of the sea, runs inshore a few miles from the edge of the Continental Shelf. It is 80 degrees (magnetic) and about 60 miles from the Inlet. The Cigar, a stogie-shaped seamount 120 degrees from the inlet, is about 65 miles out. These two areas have produced a lion's share of the billfish caught by Virginia boats in the past decade.

For most anglers, a trip to the marlin grounds begins early, long before the sun begins its brilliant ascent above the eastern horizon. And a sunrise on the ocean is an unforgettable sight, with the sun a sliver of magenta which peaks at you and then slowly grows into a giant, blinding balloon. Look overhead and you'll see scattered gulls, always seeking a handout. Look alongside and, if you're lucky, you might see playful porposises following your offshore progress.

Once on the fishing grounds, the boat's crew (the mate, if you're on a charter boat) begins laying out a smorgasbord of delicacies for tempting one of the most exciting creatures in the ocean. The offerings, rigged on hooks that some may deem big enough for Moby Dick, are normally prepared with the skilled touch a surgeon. The menu may range from eels to squid to mullet to small ladyfish.

But the overwhelming favorite, in Virginia and in most other areas where marlin congregate is the balao (pronounced ballyhoo and actually a halfbeak). It averages between eight and 17 inches long and can be rigged to either skip across the surface like an injured baitfish or to swim just under the surface, like a scared baitfish. Usually, some sort of plastic-lead contraption, such as a Sea Witch, fits down over the nose. Hooks are usually 7/0 or 8/0 and are almost always rigged singularly, rather than in tandem.

My own preference is swimming baits since I don't think it's natural for a billfish to have to strike half its head out of the water to get something to eat. And that's the case with skipping baits. With swimming baits, the fish merely swims up to it and dines, naturally.

In recent years, there has been a decided switch to artificial lures for billfishing. But while a few Virginia anglers have made the switch, the idea has been slow to catch on. I've used them and learned two things: You can cover a lot more ground since you troll faster; Marlin seem to be easier to hook, again because of the added speed.

Most boats usually troll between four and six rigs at the same time, depending on the crafts's size and the skills of those aboard. Two baits are pulled from pins near the tips of the extended outriggers and two others directly from "flatline" rods on either side of the transom. You can also pull fifth and sixth baits from pins about halfway up the outriggers.

In all cases, reels should be locked in gear with enough drag to set the hook if a fish strikes and pulls the pinned line from the outrigger. Frequently, this results in hooked fish. Often, though, it doesn't. And then begins a cat-and-mouse game between angler and adversary. Here is where skill, the kind developed only with experience or, for a select few, with God-given talent, comes into play. On occasion, a white marlin will give you more than one chance. If he missed the bait on the first try, he'll come back again. And sometimes again and again. But there's no guarantee.

In 1937, the best white marlin action was in 90 to 120 feet of water, less than 20 miles offshore. Today, the hottest fishing usually develops along the edge of the Continental Shelf, known as the "100-fathom line." The water is 600 feet deep, and beyond it the bottom quickly drops to several hundred fathoms. Still, there are occasions when whites are found in 30 to 40 fathoms of water and rarely they'll venture into 20 fathom (120-foot) areas.

A lot of things about billfishing have changed since the July day when Johnny Cass and his fares boated 11 whites off Chincoteague, disrupting the Pony Penning and carnival. But the one thing that hasn't changed is the fish itself—the white marlin is still a king presiding over a magnificent royal kingdom. □

The *Bear* Necessities

Students from Virginia Tech study the needs and habits of black bears in Shenandoah National Forest.

by Ann B. Brown

The late February sun warms the craggy top of Stoney Man Mountain in the Shenandoah National Park. Slipping and sliding through the rapidly melting snow, a team of research scientists makes its way cautiously down the steep western slope of the mountain. Quiet is essential. A female black bear is asleep under a ledge just a few feet away. Dan Carney holds a radio antenna in one hand. The receiver dangling from his neck emits a slow, steady beep. It is picking up the signal from the radio collar which the team placed on the bear the previous summer. She is in a deep trance-like state. If she raises her head and starts to move, the sound will become more rapid.

Carney hands the antenna and receiver to Nathan Garner and climbs up to the mouth of the cave. Crouching down, he listens intently. "She's got cubs," he whispers. "They are squealing like little pigs."

Carney and Garner, graduate students of Virginia Tech, with technicians Alison Teetor and Jim Stuart, are working on a three-year study of black bears in the Shenandoah National Park. They are assisted by park staff members under the direction of David Haskell, Resource Management Specialist. The research project which began in 1982 is funded by the Park Service, the Virginia Commission of Game and Inland Fisheries, and the United States Fish and Wildlife Service. It is being conducted by the Virginia Cooperative Wildlife Unit based at Virginia Tech.

Of the many types of wildlife living within the park boundaries, bears are the largest and most interesting. The highly intelligent bear is extremely wary and few visitors to the park are fortunate enough to see one. The lucky motorist out at dawn or dusk might catch a glimpse of a dark shadow moving purposefully across the drive. Back country hikers and campers do see bears more frequently but usually not if the bear gets wind of them first.

Bears are not aggressive and prefer retreating to fighting. If a bear invades a remote campsite in search of food, loud shouting and the banging of pots and pans will send him scurrying back to the forest. Since bears can usually smell or hear a human coming a quarter of a mile away, meeting one on a trail is unlikely. However, chance meetings do occur to the surprise of both bears and humans. These meetings are usually the result of people coming quietly upon the bear upwind. In other cases, a bear may be so disturbed by something coming behind him, that he doesn't care what is in

Alison Teeter

Dave Catlin

(Above) Jerry Blank assists in examining a park cub. (Left) Adults, as well as cubs like this one, can climb well.

front of him.

Ben and Sharon Harrison met such a bear on their way up White Oak Canyon trail. He was determined that he had the right of way on the steep switch-back path below the fall. They hastily agreed to give it to him and dropping their knapsacks took the shortest, most direct route down the mountain. The bear continued on his way, ignoring them completely and splashed across the stream, and disappeared among the trees.

Although the original range of the black bear was from Alaska to Florida, there were few bears left in the Blue Ridge Mountains when the Shenandoah National Park was opened in 1933. Bears began to appear in the park in the mid-1950's. The second growth forest of deciduous trees and evergreens is prime bear habitat. The population grew and by the mid-1960's, bears began to cause serious problems within the park.

"Bears are opportunistic feeders," says Dave Haskell. "They are omnivores and eat anything. Basically, they are shy and easily frightened. However, they are large, powerful animals. They can weigh from 200 to 500 pounds. When such an animal loses its natural fear of humans, it can be very dangerous." Bears were frightening people and doing a lot of damage in the picnic areas and camp grounds.

In 1975, there were nearly 250 bear-related incidents resulting in over $14,000 in property damages within the park. Fortunately, no one had been seriously injured. Getting rid of pan-handling bears and relocating other bears to more remote areas in the park became necessary. These bears were caught in large sections of culvert pipes modified to serve as live traps. The worst offenders were taken to National Forests in the Alleghenies and released. A few came back. One persistent bruin, nick-named Rambling Rose, was so fond of sharing picnic lunches on the Skyline Drive that she came back to the park three times. Game Commission researchers logged over 800 miles of her travels in one summer!

In order to keep bears out of the more frequently visited areas, $100,000 was spent to install bear-proof garbage cans. All edible refuse is hauled out of the park and rules pertaining to food brought into the park are strictly inforced. Food cannot be left unattended. Food containers must be locked in cars. Campers in the remote areas must hang their supplies from a tree in such a way as to prevent a bear from reaching it. These stringent efforts to keep bears and people separated have greatly

William Lea

Bears are solitary animals, wary of each other and avoiding contact whenever possible.

reduced the number of bear-related incidents.

According to Haskell, the bear research project was begun to learn as much as possible about bears and their habits, for the sake of the bears and for the millions of people who visit the park each year.

"We want to know how many bears are in the park," says Haskell. "The official estimate of 300 bears which is one per square mile is probably conservative. This would give the park the highest density of bears in the country."

The data gathered in the study, which is limited to the central area of the park, includes the reproduction rate of bears, the rate of increase in the number of bears, general health of the bear population and the size of individual home ranges. (Young bears may range over 100 square miles. Females with cubs have the smallest range; probably 10 square miles. Adult males and females without cubs have ranges somewhere in between.) The study also shows favored habitat and diet throughout the year, how much travelling bears do outside the park, and most importantly how wild bears react to people.

"Working with bears is fun and exciting," says Carney, who worked on a grizzly bear project in Montana. "Black bears are not as dangerous as grizzlies, but you do have to be careful. All you need is one careless moment to get into a lot of trouble."

"Most bears are smart. Once a bear is caught, it is hard to trap again. There are smart bears and dumb bears. Some bears are never caught," he goes on. "Others are caught again and again."

A trapped bear is immediately immobilized with drugs shot from a dart gun or injected with a syringe at the end of a jab stick. The drug will keep the bear asleep from 35 to 45

"Black bears are not as dangerous as grizzlies, but you do have to be careful."

minutes. During this time, the bear is weighed and measured. A small premolar is extracted to determine the age of the bear. Blood samples are taken for the Virginia Game Commission to monitor the presence of parasites or other health problems. (Most park bears appear to be in excellent health.) An individual number is tatooed inside the bear's lip. The same number appears on the ear tag. So far over 125 bears have been tagged. Carney hopes eventually to place tags on the entire population.

Twenty-two females and nine males have been fitted with radio-transmitting collars. The collars have a cotton space connecting the ends which will eventually rot. This will allow the collar to fall off when the survey is completed or to break if it becomes too tight.

"We don't want our bears irritated by their collars," says Nathan Garner, who is making a study of the bear's eating habits by studying their feces.

Each collar transmits a different signal which can be picked up by a receiver with a directional finder. Bears are located from the ground several times each week, and from the air once a week weather permitting. When the leaves are off the trees, the bears may be seen from the air. The exact location is pinpointed on the map. This helps determine the home range of each individual bear.

Aerial infrared photos are taken to show the types of forest in the park. Alison Teetor hikes to the place the bear was last seen to determine what it was eating. The information she gets, along with the maps, will indicate the types of forest bears prefer at different times of the year.

Bears will eat anything they can find. Their diet changes with the seasons. In the spring and the summer, they eat grasses and forbs. As the summer progresses, they eat squaw root, berries, nuts and fruit. They also eat crickets, yellow jackets, termites, ground squirrels and other small rodents, amphibians or lizards they can catch.

Bears will eat meat whenever they can. Although unable to catch adult deer, they enjoy eating road-killed deer and other carrion. Sometimes, they do kill a small fawn or unwary woodchuck which has strayed too far from its den.

The tendency of young males to range far outside the boundaries of the park, and the fact that they are omnivores and seem to enjoy a change in diet as much as humans, often bring bears in direct conflict with humans. Bears are notorious for their love of honey. They raid bee hives set out in orchards. They climb into pig pens, occasionally killing and eating piglets as well as dining from the trough. Bears can and do kill

David Haskell

lambs and a large bear will even kill a calf. Bears enjoy fresh corn. A marauding bear can do a lot of damage in a corn field during one night's feast.

According to Garner, some of the park bears get shot when they invade farms or during the fall hunting season. The Shenandoah National Park is in the "heart of Virginia's bear range." Counties surrounding the park have shown a significant increase in the annual legal harvest of bears.

"Several of the bears with collars have disappeared. They probably got into trouble when they went outside the park," says Garner. "Bears are unpredictable. They behave differently on different days. We knew cubs could climb well, but we've been surprised at how well adults climb. A black bear can climb a tree like a monkey."

Bears are solitary animals. A mated pair will stay together for a month in early summer. The cubs remain with their mother until they are one year old, even denning with her their first winter. A female bear typically mates every other year. She usually has one cub after her first pregnancy. From then on she usually has twins. In rare cases, triplets or even quadruplets are born. Siblings may travel together for a while during their second year. After that, bears prefer to live alone. They may meet on the trail where their ranges overlap or feed peacefully where there is a plentiful food supply. But bears are wary of each other and avoid contact whenever possible.

In the fall, bears eat acorns, nuts and other hard mast from the forest floor. The high energy contained in this diet enables bears to put on the thick layers of fat which sustains them during their hibernation in winter. Denning is probably a survival

(Top) Bears in this study are located with radio directional finders several times each week. (Bottom) Trapped bears are weighed, measured and have a tooth removed for aging.

technique which bears have developed to keep them through the cold months when food is in short supply.

The time of denning depends on available food supply, amount of daylight and weather conditions. pregnant bears enter their dens in November, females with cubs den next. Males may enter their dens as late as December or January depending upon available food and weather conditions. The sequence is reversed in the spring. Males come out in March and bears with new cubs don't emerge from their dens until the middle of April.

Male bears don't appear to care where they den. They huddle up in a pile of leaves in a thicket or under a rock ledge. Female bears are more particular.They den in caves or even in hollow trees as high as 40 or 50 feet above ground. One bear was found 12 feet down inside a tree. Only four percent of the bears studied in the park used a den which had been occupied by another bear the previous year. This natural selection probably cuts down on the spread of disease and parasites.

After the females with collars have denned, they are checked frequently. They are drugged, and removed from their dens to be weighed and have their collars readjusted. New born cubs are examined, weighed and tagged. Cubs may weigh as little as a pound when born in late January. By the end of March, they will weigh from three- to five-pounds.

"Black bears are not true hibernators," says Haskell. "They are in a deep sleep. But they can hear and smell and will wake up if something disturbs them or they sense danger. They are slow and groggy like a person aroused from a deep sleep. A quick jab in the rump with the drug-filled syringe will knock them out so they never know what's happened to them."

On this warm February morning, the research team is lucky. Removing a drugged female bear out of a cave will be a lot easier than dangling her down from a big tree in a rope sling.

Taking a heavy-duty flashlight and the jab stick, Carney creeps slowly into the cave. The team waits expectantly. Garner listens to the monitor. The beep remains slow and steady.

Carney backs out of the cave and swings around on the narrow rock ledge.

"She's out," he says with a sigh of relief. "She's got triplets." In his arms are three tiny black cubs. □

Bird of the Month

The Osprey

The osprey is one of the very few birds found on every continent. In those regions where it does not nest, it is found either in passage or as a winter resident.

Yet its distribution over this vast territory is far from uniform. Over most of its range it is an uncommon bird; in some parts it is rare, in others, almost unknown. In a few scattered localities, it is quite common.

One of these favored areas is the Chesapeake Bay and the adjacent tidewaters. Here the osprey seems to find both the necessary ecological conditions and freedom from human persecution. A ready supply of fish, in relatively clean, clear water provides their basic needs. And a wide selection of nesting sites is available: duck blinds, navigational buoys, piers, telephone poles and other man-made supports. Equally essential is the presence of an appreciative, protective human population. People in the Bay area like and admire the osprey and do not hold against it the few fish it takes.

Such an attitude is in strong contrast to the hostility the osprey faces in other parts of the world. In northern England and Scotland, the birds were persecuted relentlessly for centuries. Gamekeepers, fishermen and landowners considered them serious pests and resented any competition for fish. The "fish hawks" were hunted even to the most remote highland lochs, where the last ospreys had retreated.

Breeding ospreys finally disappeared from Scotland about the turn of the century, and were gone for more than fifty years. They have returned in the past decade, and a few are nesting under strict protection. These individuals must still face danger on the wintering grounds, where they are shot by African natives, and on their hazardous journeys. Too, there is the problem of pesticides, to which all fish-eating birds are highly susceptible.

Even the prospering Chesapeake Bay ospreys have not been immune from the deadly effects of pesticidal poisoning. Before the use of DDT was banned, ospreys along the Atlantic coast suffered several years of breeding failure, and their numbers dropped noticeably. The build-up of chemical residues in their systems resulted in extremely thin eggs shells, which broke under the pressure of the incubating parent.

Ospreys arrive on their Chesapeake breeding territories in mid-March. (An Eastern Shore tradition holds that they always show up on St. Patrick's Day.) They have wintered to the south, possibly as far as South America. One bird, banded in July along the Chesapeake as a nestling, was recovered but a few months later in Brazil. Another, also banded in July along the Chesapeake, was shot while wintering in Cuba.

One cannot usually tell if these first spring arrivals are migrants, moving through, or are returning natives. Obviously if they show attachment to a particular nest site or exhibit territorial behavior, they are breeders come home. But many observations are merely of birds flying over.

The males, a bit smaller than their mates, are the first to reach the nesting ground. As soon as the females arrive, about a week later, courtship and nest building begins. Both birds spend lengthy periods at the nest site, resting and preening.

The love-flight or courtship flight of the osprey is not so impressive as that of other raptors. There are no intricate aerial maneuvers or plummeting dives, and no mid-air rolls. Instead, the male bird mounts to an unusual height, then poises, hovering, all the while uttering a shrill scream, quite different from the usual call. All of this continues for about ten or 15 while the female circles below.

Very soon after their return, the birds set to nest building, often a matter of repairing last year's structure. When there is not sufficient driftwood or downed branches handy for the repair job, the ospreys fly over wooded tracts and attempt to break off dead branches from standing trees.

Most osprey clutches consist of three eggs. Incubation which requires nearly a month along the Atlantic coast, is the task of the female only. (Curiously, in Europe the pair shares this duty.) The male does nearly all of the fishing at this time, bringing food to his mate on the nest.

The young hatch at intervals, so the eldest is considerably larger than the youngest. Though weak and feeble at first, they are able to sit upright in two weeks, and in six weeks are able to stand and perform flapping exercises. Another week is required before their first flight.

Most Chesapeake ospreys, young and old, depart for winter quarters before the end of September. Occasional birds, seen as late as Thanksgiving, are most likely delayed migrants from farther north. □

by John W. Taylor

July Journal

Hunting This Fall? Get in Shape Now!

by William Forgey and
Jim Meuninck

illustrations by John Snyder

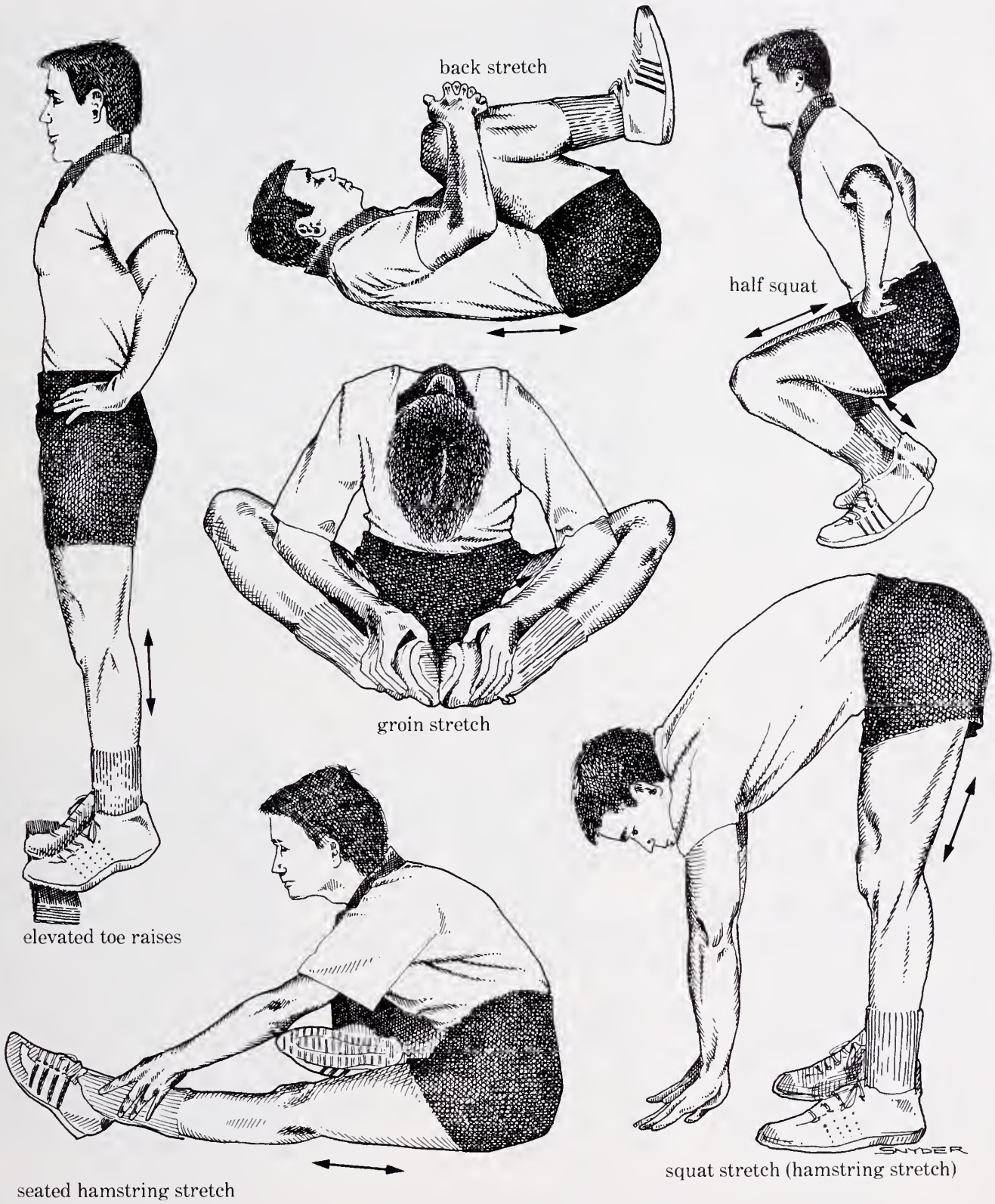
Moderate to strenuous exercise once a week can be hazardous to your health. Weekend only-bikers, campers and other outdoor enthusiasts are more susceptible to physical injuries, including heart attacks, than the physically fit—three work outs-a-week-fitness buff. Moreover, your flexibility and full range of motion slip away as we age. Yet, with balanced nutrition, adequate motivation, and a realistic exercise plan there appears to be evidence you can slow the aging process. In time, with the right personal fitness plan, you can improve heart and lung performance. Your blood volume will increase, and you will have more hemoglobin available for oxygen transfer. You may even experience the "tranquilizer effect" of long-term rhythmic exercises. Your alertness and overall well-being will improve. Muscle tone will be enhanced. You will sleep better and, with proper conditioning, you will be less susceptible to heat stroke, physical fatigue, and devastating heart attacks. So let's get started.

How to Begin:

Your fitness plan will require you to achieve and pass through several levels. The entry level requires five minutes of vigorous walking—followed by mild stretching exercises. This post-workout stretching should be done patiently without force and only when muscles and tendons are warm. Dedicated adherence to a full range of movement and flexibility exercises will keep you hiking and canoeing long after your peers are in their rocking chairs.

When you are convinced the five minute walk regimen is too easy, increase the time or distance—preferably both. Stay at this second level until it is comfortable and too easy. Again, proceed to lengthen your time or quicken your pace.

By the end of six weeks your three or four day-a-week workouts should be sustained for twenty to thirty minutes. This a good plateau to maintain fitness. Continue the full range of flexibility exercises you do near the end of each exercise period. □


back stretch
half squat
groin stretch
elevated toe raises
seated hamstring stretch
squat stretch (hamstring stretch)
SNYDER

July Journal

New State Record Fish Program Starts July 1

Effective July 1, 1985 Virginia's freshwater anglers will have a new opportunity to catch a record fish. At that time most existing records will be enshrined permanently as "Historic Records."

The decision to make this change occurred when the Commission formed a State Record Certifying Committee to review and pass upon all applications for recognition as state records. Reviewing the existing records, the committee of biologists determined that there was little uniformity in the manner in which our existing records were certified Exact weights and, in some cases, species determination were not officially confirmed.

The Committee established a set of strict standards by which potential state records were evaluated. This system was tested in evaluating the recent new record largemouth bass and a new record brook trout and found to be satisfactory. Inasmuch as both of these fish met the new standard, they will be carried forward as official records under the new program. All other species will be open. To qualify for a new state record a fish must equal or exceed the minimum weights shown below.

The new rules for certifying a state record are as follows:

1. The fish must be caught in Virginia waters or the Potomac River bordering Virginia by legal hook and line, no commercial methods. The angler must identify the specific water from which the fish was caught.

2. A Commission employee must witness the official weighing. *Only the weight observed by the Commission employee will be certified.* The fish must be unfrozen, in whole condition and made available to the Commission employee for a thorough examination. The fish may also be made available to the Commission for further examination if deemed necessary by the Commission Representative.

3. The species of the fish must be confirmed by a Commission fish biologist who must inspect the fish in whole condition. (This can be accomplished subsequent to the weighing if the Commission witness is not a fish biologist).

4. Application must be made within 60 days of the catch. A clear, side view photograph of the fish should accompany the application.

5. Scales used to weigh the fish must be appropriate to the size of the fish and subject to periodic inspection by the Commonwealth of Virginia. Fish under 25 pounds must be weighed on a scale capable of weighing to the half ounce. Fish over 25 pounds may be weighed on scales having no greater graduations than a quater pound.

6. The Commission reserves the right to disqualify any fish if any doubt exists concerning any of the circumstances surrounding the capture or of the weight or species of the fish. Any disputed catches between two anglers will also be disqualified.

The minimum weights for potential state record fish are as follows:

Original Minimum Weights Before Submission for State Record

Smallmouth bass	6 lbs
Spotted bass	3 lbs
Sunfish	2 lbs
Crappie	4 lbs
Rock bass	2 lbs
Striped bass	35 lbs
White bass	3 lbs
White perch	2 lbs
Walleye	8 lbs
Yellow perch	2 lbs
Channel catfish	25 lbs
Blue catfish	30 lbs
Flathead catfish	45 lbs
Musky (including TM)	30 lbs
Northern pike	15 lbs
Chain pickerel	6 lbs
Carp	35 lbs
Gar	25 lbs
Bowfin	15 lbs
Brown trout	10 lbs
Rainbow trout	8 lbs

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On the range at the 1st Annual Virginia Hunter Education Championship. The event, held at Izaak Walton Park in Midlothian on May 4th, was won by Bret Nikerson of Bealton in the senior competition. Junior competition was taken by Travis Sutherly of Strasberg. Both the winning junior and senior teams were from Strasburg.

About the Authors

When not writing skunk humor for us, **Joel Vance** is writing news for the Missouri Department of Conservation as well as a regular column for *Gun Dog.* **Curtis Badger** works from his home base on Maryland's Eastern Shore as a freelance photojournalist. Outdoor writer and frequent contributor to *Virginia Wildlife*, **Pete Elkins** works out of Fort Benning, Georgia. **Paul Pajak** and **William Kelso** are graduate research assistants in the wildlife department at Virginia Tech. **Bob Hutchinson** is outdoor editor of the *Norfolk Virginian-Pilot and Ledger Star* and author of a book on Virginia fishing. **Dr. William Forgey** and **Jim Meuninck** write about "outdoor medicine" and come to us from Edwardsburg, Michigan. **Ann B. Brown** is a writer from Millwood, Virginia. □

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